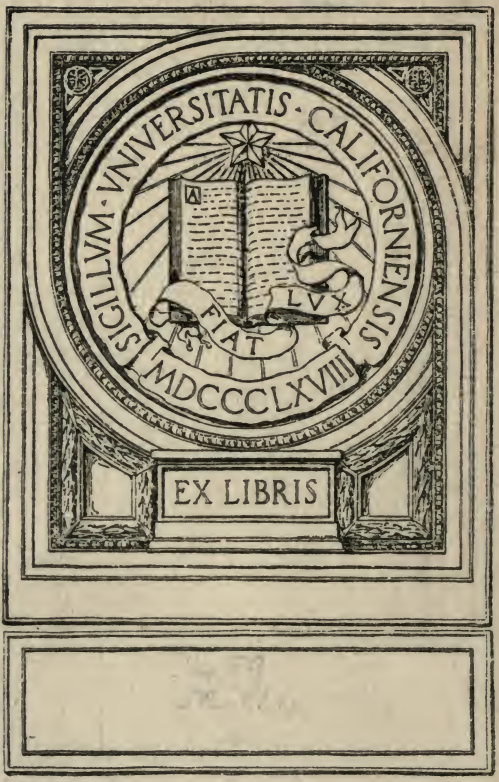
THE EDWARD BOK BOOKS OF SELF-KNOWLEDGE FOR YOUNG PEOPLE AND PARENTS

THE SPARK OF LIFE

by

MARGARET W. MORLEY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The Spark of Life

THE EDWARD BOK BOOKS

Of Self-Knowledge for Parents and Young People
Of Which This Is Number Four

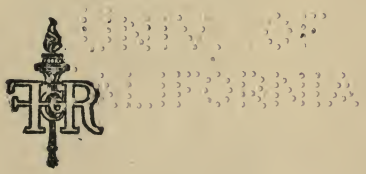
The Spark of Life

The Story of How Living Things Come Into the World

As Told For Girls And Boys

By
MARGARET W. MORLEY
Author of "The Song of Life," etc.

With a Foreword
By EDWARD BOK
Editor of the Ladies' Home Journal



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Contents

A Foreword

NO parent can truthfully say again: "No one has ever told the story of life simple enough for a child to understand." For here it is,—told as simply and beautifully as I have ever seen it told anywhere. It is astonishing how easily the author takes us through the wide sweep of worlds that she does: the world of flowers, of vegetables, of insects, of birds, of fish, of animals, and at not a single point does the interest lag or does the beauty of the wonderful story lessen. The value of the little book is, too, that it may be read by the parent, and from memory told the child, or read to the child, or read by the child itself. To either method does it lend itself; to one as readily as to the other. It never gets "above the head" of the child, as we say; or does it drop beneath the interest of the elder.

Miss Morley has in "The Spark of Life" really written a model little book of its kind, and one that is not unlikely to be regarded as the standard little work in its class.

EDWARD BOK.

Philadelphia,
January, 1913.

I

THE AMAZING WORLD OF SEEDS

SEEDS, seeds! Everywhere we look we find the seeds.

Here is a bright red apple. We cut it open, and there in the middle is the core—a tough little box filled with seeds—little black apple seeds.

Here is a golden pear. How good it smells! Cut it open and there is the core filled with pear seeds. And in the core of the quince we find of course quince seeds.

We open a peach, and we find a core as hard as wood. We call it the pit or stone, and inside the peach pit is one peach seed. Here is a handful of ripe plums. In the middle of each is the plum pit with the seed inside. When cherries are ripe we throw the cherry stones on the ground, each with its seed safe inside.

The tough cores and the hard pits hold the seeds in safe-keeping. For the seeds are important. They are alive. They are the eggs of the plants, and if they get a chance they will hatch out—sprout we call it—into tiny plants that grow and grow and in time bear flowers and seeds.

Open a bean pod—beans, that is to say, seeds, are inside. And it is the same with the pea pod; when we open it we find the peas which are the seeds of the pea vine.

There are the tiny dandelion seeds sailing about like little air-ships. They do not grow in pods. You blow them off the top of the stem when they are ripe, and away they sail, for each little seed has a pretty parasol over its head that the wind strikes and so blows it along. Lettuce seeds sail in the same way, and in the summer and autumn you will find a great many other kinds of seeds sailing about. Sometimes the air is full of them, some quite big, and some very small. The wind blows them far and wide. Down from the maple tree whirl the pretty keys—and what are these but seeds with wings? The seed of the elm tree also has its wings, and the wind whirls them away.

You think a nut is just a nut. It really is a seed. The hard shell protects the soft seed inside. When we eat a nut we eat a seed, which is just a young little nut tree. Every time we eat a chestnut we eat a very tiny chestnut tree. Every time we eat a peanut, we eat a little peanut vine.

When we eat the sweet corn from the cob we are eating corn seeds, for each kernel is a seed. And corn bread is made of the ripe

seeds of the corn. A grain of wheat is also a seed. The rice grain is a seed. Oats are seeds. All the grains we use are seeds.

If you want a flower garden you plant flower seeds. Morning-glory seeds grow on the morning-glory vines, and nasturtium seeds come from the nasturtium plants, and pink seeds from pinks, and poppy seeds from poppies.

II

THE STORY OF THE FLOWERS

IF a seed is to sprout, it must be kept warm and moist, and when the little plant starts to grow it must have the food it needs. For plants eat. Every living thing eats. Plants have mouths in their tiny rootlets down in the ground and in their leaves. They must have good food in the earth for their roots to eat.

A boy named Johnny planted his seeds in the hard and stony corner by the front steps. His little sister Molly planted hers in a corner of the garden. Johnny's seeds scarcely sprouted. Molly's came up quickly. Their father said: "Johnny, your seeds are starving, that is the trouble. They need better food." So Johnny planted some more seeds in the garden and they sprouted well. Soon a great many little green plants came up with the young flowers.

"These," father said, "are weeds; you must pull them up."

But Molly said, "They are such pretty little things I shall leave them."

Johnny pulled the weeds out of his garden

as fast as they came up, but Molly let hers alone.

After a while Johnny's garden was full of flowers. The plants were large and strong and covered with bright blossoms. It smelled sweet, and bees on gauzy wings buzzed about and gathered honey from the gay flowers, and butterflies danced over them and tasted the honey from their pretty cups.

And Molly's garden? There was hardly a flower to be seen in hers. The weeds had grown faster than the flowers and smothered them. The flowers were starved because the strong weeds had taken away the food out of the ground. They looked so small and puny that Molly felt like crying when she looked at them. "I thought the pretty little weeds had as good a right to grow as the flowers," she said. "But they don't play fair. They take everything. I am going to pull them up," and she caught hold of a big one and gave it a jerk. It came hard but it came at last. But with it came ever so many little portulacas—they were no bigger across than a penny although Johnny's portulacas were big, and all covered with gay flowers. Fourteen little portulacas came up with the roots of that big weed that had twined all among their little roots. But this isn't all. Back of the portulaca border was a border of sweet alyssum

and six of them came up too, and back of the sweet alyssum was a border of sweet peas and three or four of them were also entangled in the roots of the weed.

"It is worse than I thought," said Molly in despair.

"Go slow!" said father.

So Molly pulled the next weed more carefully, but by the time she got the weeds all out Johnny said her garden looked moth-eaten. Only about half of her plants were left and they were tall, weak-stemmed things with few leaves and fewer flowers—they could not stand alone, having depended so long upon leaning against the weeds that were devouring them. But in time they looked better, although Molly's garden did not amount to much that season.

"Just wait till next year!" said Molly.

"Meantime, let us find out a little more about how plants grow," said the children's father, and they talked about it a great deal. Molly and Johnny were astonished to find that plants are really very particular about what they eat. That one kind of plant for instance grows best when there is a substance called lime in the earth, while another kind dies if there is lime. That some plants thrive best in sandy soil, while others cannot grow in the sand, that some need a great deal of moisture, while others can live only where it is very dry.

Apples need a cold climate, oranges cannot stand frost; and so it goes. If we are to succeed with our plants we must know what kind of soil to plant them in, whether they like a shady place or a sunny place, whether they need to be kept moist or dry or hot or cold. And since they breathe we must give them plenty of clean air. Plants do not grow well in a house where there is gas or smoke in the room. Tobacco smoke will kill some plants very quickly.

"All these surroundings of the plant," father told them, "the food, the air, the light, the temperature, everything that influences its growth, we call by one word—environment. The success of the plant," he added, "depends upon its environment. If the plant does not do well we say there is something wrong with its environment, and we try to find out where the trouble is, and remedy it if we can."

Molly wanted to know if caterpillars and grasshoppers and snails formed a part of the environment of a plant. "Yes," said father, "if those insects swarm in a region, that region forms a poor environment for plants to grow in. Anything that constantly harms or destroys makes a poor environment. A good environment is a place where everything helps instead of hinders."

"The greenhouse makes a good environment for our geraniums," said Molly.

"Yes, and a snow-bank would be a mighty bad environment for them," answered Johnny.

"Yet there are plants," said father, "that live under the snow and would die in the greenhouse."

III

WHY WHITE SWEET PEAS BECOME PURPLE

"THERE is something very important besides environment in making a garden," father said one summer day when the children were getting ready to gather their flower seeds. "Gather only the best seeds from the best plants. You must select your seeds with care. If you plant small, weak seeds, you will be likely to get small, weak plants. Choose your seeds from the handsomest and best flowers."

"Yes," said Molly, "I have taken all my sweet pea seeds from those lovely deep red ones. I like them best and next year I shall have a long row of them."

"I have gathered seeds from the white sweet peas," said Johnny, "and those lilac and blue ones that mother likes so much. We will have a fine garden next year. Good soil, good care, plenty of water, no weeds and ——"

"A good environment," interrupted Molly.

"That's right," said father. "A good environment and good big, strong seeds; what more could any one ask?"

But next summer when the sweet peas blos-

somed Molly was disappointed because her pea vines did not bear red flowers. There were some red flowers, it is true, but many that were white, or pink or blue, and these colours combined in the same flower.

Johnny was no better off. Although he was sure he had gathered seeds from only the white and pale blue and lavender flowers, his vines blossomed out in the colours of all the sweet peas.

"What can you do if you plant the seeds of red flowers and they bear white flowers?" Molly asked disconsolately.

Father shook his head. "There must be something about this we don't understand," he said. "Let us see if we can get the flowers to tell us their secret. It is in the flower we must look for the seeds, you know," and father carefully opened a sweet pea blossom. Sure enough, in the centre of the flower was a tiny green pod with the merest pin-heads of seeds in it. "Those little seeds are each fastened to the pod, you see, by a little stem," father said, showing them how it was. "It is through this stem that the blood of the plant or the sap, as we call it, comes to the seed to nourish it. It grows on this sap until it is ready to leave the plant and start growing on its own account. We call this young seed the ovule, and the pod we call the ovary."

"Does the ovary hold the ovule?" asked Johnny.

"It does," said father. "Into the ovule, through the little stem that fastens it to the ovary, comes the good sap to nourish the seed.

"Then the ovule grows. It becomes a perfect pea, ripe and ready to sprout. But besides nourishment it has taken something else from the mother plant. It has taken the nature of the mother plant. When it grows it will make a plant just like the mother plant, the same kind of stem and leaves and flowers. Every sweet pea vine seed will grow into a sweet pea vine. Every morning-glory seed will grow into a morning-glory vine, every apple seed will grow into an apple tree. The seeds never make a mistake. When you plant corn, you know what will come up. When you plant marigold seeds in your garden you are sure that marigolds will grow from them. All the seeds grow into plants like the mother plant."

"That is because the seeds are the children of the plants, I suppose," said Molly, "and children must be like their parents."

"Yes, but why did my white sweet pea seeds have purple flowers?" demanded Johnny.

"Well," said his father, "now that we have it settled that sweet pea seeds come from sweet pea vines and grow into other sweet pea vines,

perhaps we can find out why the sweet peas are not all alike, but first we must understand a little more about heredity. There comes mother; she can help us. Come, mother, we are talking about heredity."

Molly, making room for mother at her side on the garden bench, gave her hand a little squeeze as she cuddled close up to her and asked:

"What is heredity?"

"It is inheriting," said father, "not lands or money, but your looks and your shape and your way of moving, and even to an extent your habits and way of thinking from your parents."

"That is why I inherit blue eyes from mother," said Johnny.

"And I curly hair from father," said Molly.

"Yes, but you inherit something better than that from him," added mother. "A good mind and a kind heart."

"Well," said father, "if that is so, you have a double inheritance of those good qualities, for you get them also from mother."

"Well, then," said Johnny, "Molly and I and little Tom have what you call a good heredity and a good environment."

"Yes," replied father, "I think you have.

"But now about those purple peas. Just

look into the sweet pea blossom and see the little pockets filled with flower dust, pollen we call it."

"Oh, I know about pollen," said Molly—"bees gather it into the little baskets on their hind legs, and they make it into little balls by mixing it with honey and they carry it to the hive and store it away to feed the baby bees."

"Yes, it is the bee-bread," said Johnny, "and all flowers have pollen. I know how it shakes out of the goldenrod in clouds."

"Yes," went on mother, "and don't you remember what funny brown noses you got from smelling the tiger lilies?"

"I remember," said Molly, "how funny Tommy looked with his little face, nose, cheeks and forehead smeared over with brown pollen."

"Do you remember where the pollen came from?" asked father.

"I do," said Molly; "it came from the anther pockets on the tips of the long slender stamens that reached way out of the flower."

"All the flowers have these anther pockets full of pollen," said Johnny.

"The bees take the pollen," added mother, "but the pollen was not made for the bees. It was made for the good of the plant itself."

"What good can that dust do the plant?" asked Johnny.

"It was the pollen that made your sweet peas purple," father answered.

Johnny opened his eyes wide at this. "It does seem strange, doesn't it, yet it is true," father went on. "If you were to look at the pollen under the microscope you would find it made up of tiny grains, like little seeds. In a way, it is little seeds."

"Can we plant them?" asked Molly.

"No," said father; "they cannot grow until they have entered into the seed and become a part of it."

"How can it enter into the seed?" asked Johnny.

"Look again at the tiny pod in the heart of the flower. You see that it ends in a little sticky point called the stigma. Now when a pollen grain touches this little sticky stigma it is held fast, and soon grows down into the pod, and finds its way into an opening in the little ovule. When this happens, the ovule begins to grow into a perfect seed. Without the pollen the ovule could not grow. Without the ovule the pollen grain could not grow. Both are needed. This union of the pollen with the ovule," said father, "we call fertilization. If the ovule is not fertilized it soon withers and dies."

"Does the pollen inherit?" asked Molly.

"Oh, yes, the pollen and the ovule both

inherit. If the pollen and the ovule both came from a white sweet pea what kind of sweet pea will grow from that seed?"

"Oh, I see," said Johnny; "a white sweet pea will come, but if the pollen came from a red sweet pea to the ovule of a white sweet pea, we might get a red sweet pea seed from a white pea vine."

"Now you've got it," said father. "That is all there is to it. If the pollen of a red pea unites with the ovule of a white one, then the plant that grows from the new seed may bear flowers that inherit the red colour from the pollen, or they may inherit the white colour from the ovule."

"And that is why some are red and white," said Johnny. "The seed inherits from both parents."

"Just so," agreed father.

"Is the pod with the seeds the mother, and the pollen the father?" asked Molly.

"Yes," said mother; "that is a pretty way to think of it."

"Now, how does the pollen from a red flower get to the stigma of a white one?" father wanted to know.

The children thought a while. Finally, Johnny asked, "The bees?"

"Right again," said father. "When the bees go from flower to flower they touch against

the stigma and leave some of the pollen grains that have clung to their hairy bodies."

"It is too bad," said Molly, "for the bees to mix up our flowers that way. We ought to put a net over them to keep the troublesome things out."

"No, no, child," laughed mother; "if you did that, you might not have any seeds at all."

"Why not, mother? The pollen is in the flower close to the stigma. Why would it not shake out over it when ripe?"

"For a very good reason. The flower does not want its own pollen. It wants the pollen from another plant and so the stigma is hidden in the flower. It cannot be reached until a bee alights on the flower. The bee's weight presses down the part where the stigma is hidden, until the stigma comes out and the pollen on the bee can touch it."

"I should like to see that," said Johnny.

"Nothing easier," answered father. "All you need do is to watch when the bees come out and fly about the sweet pea flowers to get their breakfast."

"Or," added mother, "you can press the flower apart with your own finger and see the little stamens come forth."

IV

WHY PUMPKINS DO NOT GROW ON ROSE-BUSHES

"WHY doesn't the flower want its own pollen?" asked Johnny after a few minutes.

"There is a fine reason for that," said father. "If the flower is constantly self-fertilized, as we say when it takes its own pollen, it in time grows weak and puny. It needs to be cross-fertilized, that is, it needs to receive the pollen from some other plant, to keep it strong."

"Doesn't any flower take its own pollen?" asked Molly very much interested.

"Oh, yes, a great many flowers take their own pollen, but still they are often cross-fertilized by the insects, and there are a great many flowers that are made so they cannot get their own pollen and but for their insect visitors would never be able to mature any seeds. Sometimes the male flowers are entirely separate—even grow on different plants. I can show you a maple tree that bears only male flowers, and near it another maple tree that bears only female flowers."

"Come now," said mother, "and I will

show you something right away." And she led them to the cucumber patch. "There, some of those flowers have no pistil at all. They have only stamens. We call them staminate or male flowers. Some others that have no stamens are pistillate or female flowers. See who will first discover a pistillate flower."

"They all look alike to me," said Johnny.

"And to me," added Molly, regarding with a puzzled look the little yellow flowers that covered the cucumber vines.

Finally Molly exclaimed: "Oh, I know!"

At this Johnny began to look very carefully. "Oh, gee!" he shouted at last, "it's as plain as the nose on your face."

"Well, now how is it, Molly?" asked mother.

"Why, the female flowers have little cucumbers below them, and the male flowers have not. Isn't that right?"

"The little cucumbers are the ovaries and they are full of seeds," added Johnny.

Father smiled. "That is exactly the way it is."

"Now look into the flower that has the little cucumber below it," said mother, "and see if you can find any stamens."

"No," said Johnny after he had looked into a number of the pistillate flowers; "no pollen here, only the big sticky stigma."

"But there's pollen enough in the flowers

that haven't any little cucumber," Molly announced, for she had been looking into the staminate flowers; "see," and she held up her finger all dusted with pollen.

"Yes," said father, "so you see the bees are rather important members of society. Without them to carry pollen about we should have no cucumbers, no melons, no peas or beans; indeed we should miss a great many fruits and flowers but for the industrious bees and other insects. The way they fertilize the flowers is a very beautiful story which some day you will want to know a great deal about."

"When we buy flower seeds they come up the right colours," said Johnny puzzled.

"Yes," answered his father, "I was waiting for you to think of that. Suppose we planted cucumber seeds and when they came up and the vines blossomed there were no bees—what could we do?"

"Could we put the pollen on ourselves?" asked Molly.

"That is just it," said father approvingly. "We could take a little brush and rub it against the pollen, and then against the stigma, thus fertilizing the flowers ourselves. So, if you want white sweet pea seeds, the way to do will be to cover a few white blossoming vines to keep the bees from interfering, and with a tiny brush collect the pollen from other white

blossoms, press down the lower part of the flower of the covered vine as the bee does, and dust the stigma."

"But what a lot of work!" said Johnny.

"Yes," assented father, "and that is why those fine selected seeds warranted to come true to their colours cost so much more than common mixed seeds."

"You should gather pollen from the largest and handsomest flowers," said Molly.

"Indeed you should," agreed father.

"And fertilize only the stigmas of the largest and handsomest flowers," added Johnny.

"And gather only the largest and best seeds when they are ripe," added Molly.

"And give your plants good soil and plenty of water," added mother.

"Give them a good environment and a first-class heredity," concluded Johnny as they all went in to supper.

"Father," asked Johnny next day, "is it by fertilizing one flower with another that people get so many new fruits and flowers?"

"Yes, partly," said father. "Some of our finest grapes for instance have come from careful selection, that is, fertilizing or breeding two different kinds of grapes together. And we get other fruits in the same way—apples for one thing. Making new kinds of fruits or flowers we call plant-breeding. We can breed

almost any kind of fruit we want by taking pains enough and keeping at it long enough."

"Why isn't the world full of well-bred fruits and flowers?" asked Molly.

"Because," said father, "high bred plants take a good deal of time as well as a good deal of knowledge, and when we have succeeded in getting something worth keeping we have to watch it and care for it, or it will revert to its original form. It is easier to go down, you know, than to go up. If you neglect your garden even one summer you may lose the work of several years."

"But if everybody attended to their gardens and had only well-bred fruits and flowers, wouldn't it make a difference?" asked Johnny.

"Indeed it would. If everybody worked to keep out weeds and selected only the best seeds and planted them everywhere and cared for them, then everybody could have the choicest fruits and flowers."

"I am going to fertilize an easter lily with the pollen of a red rose and see what a lovely flower I can make," said Molly one day.

"No," said father, shaking his head, "you can't do that. Just think how everything would be all mixed up. We might have pumpkins growing on rose-bushes and roses on tomato vines. We should never know what would result when we planted our seeds."

"Peas on apple trees, and strawberries in the potato patch!" shouted Johnny, and both children laughed at the thought.

"But, father," Johnny went on after a little while, "what prevents? I should think the bees might often carry pollen to the wrong flowers."

"Doubtless they do," said father, "but pollen cannot act excepting on the right flower. If the bees left rose pollen on a lily, for instance, the rose pollen could do nothing. It can unite with only the ovule of the rose. It would just wither up and die on any other flower."

"And the pollen of the apple can only join the ovule of an apple blossom, and the pollen of the nasturtium only the nasturtium ovule," added Johnny.

"Yes," said his father, "that is true. And it is very fortunate. We can fertilize different grapes together and experiment until we get almost any kind of grape we want. And we can do the same with peaches, and any fruits or flowers, making each ever more perfect of its own kind. But we cannot mix up grapes with peaches, or peaches with apples."

"I am glad of it," said Molly. "We want strawberries to be strawberries, and roses to be roses."

V

WHY THE BUTTERFLY LAYS ITS EGGS ON A LEAF

"LOOK at the seeds growing on this leaf," said Molly one day.

"Nonsense," replied Johnny; "they can't be seeds. Seeds don't grow on leaves; they grow inside the flowers."

"Well, they look just like seeds, anyway."

"So they do," assented Johnny after looking quite carefully at the little green things on the back of the leaf. "Let's ask father."

So they ran to their father and showed him what they had found.

He looked carefully and then said, "These are seeds—but they are not plant seeds. They are butterfly seeds."

"Butterfly seeds!" exclaimed both children.

"Yes," father went on, "butterfly seeds. We call them eggs, of course, but it is the same thing."

"Do they grow in an ovary?" Johnny asked.

"Yes," father said, "they grow in an ovary inside the butterfly, just as the seeds grow in an ovary inside the flower. They are nourished by the blood of the butterfly and when they are ripe the butterfly lays them."

"Why does the butterfly lay its eggs on a leaf?" asked Molly. "I should think it would lay them in a pretty flower so when the little butterfly hatches out it would have a flower cradle to sleep in."

"But you know," said father, "the butterfly egg does not hatch into a butterfly."

"Oh, I remember," said Johnny; "of course it hatches into a little caterpillar."

"Yes," added Molly, "and the caterpillar eats and eats and grows and grows. Its mother lays the egg on just the kind of leaf the little caterpillar will like to eat when it hatches out." Then turning to father she asked, "How does the butterfly know what her little caterpillar baby will want to eat?"

"Because mothers know what is good for their children," said father. "Each kind of butterfly lays its eggs on just the right leaf. You can often tell what the little egg will hatch into by the leaf it is on. The butterfly takes great care to give its offspring the right environment."

"What does offspring mean, father?" asked Molly.

"It means children, and all good parents try to find the best environment for their offspring. That is why the big moth we watched last spring laid its eggs on the tomato vine."

"It must be terrible to have to eat tomato leaves," said Molly, making a wry face.

"Not if you like them," said Johnny.

"That caterpillar would find your breakfast as uneatable as you would find a tomato leaf," added father.

"All because you are you, and a caterpillar is a caterpillar," added Johnny.

"Do mosquitoes lay eggs?" asked Molly.

"Of course," said Johnny. "Don't you remember the wigglers in the water barrel? Well, they hatched out of mosquito eggs."

"Oh, yes, I forgot," said Molly, who was younger than Johnny and so did not remember quite as well sometimes.

"And beetles lay eggs," went on Johnny, "and so do flies and bees and dragon-flies. I guess every kind of insect lays eggs. Doesn't it, father?"

"Yes, that is the only way for insects to come into the world. They must start as eggs. And every kind of insect knows just where to lay its eggs so that the young when they hatch out can get food. Or else the parents bring them food."

"Like the bees," said Molly.

"Yes," went on Johnny; "the old bees feed the little grubs just as the old birds feed the baby birds."

"Do insects inherit?" asked Molly.

"Of course," said Johnny; "butterflies' eggs make butterflies, don't they?"

"I didn't mean that. But do the butterflies inherit bright colours and pretty spots the way the flowers do?"

"Yes, indeed they do," said father.

"Then if we kept the eggs of the handsomest and biggest butterflies would it be the same as gathering the best flower seeds?"

"It would be the same," said father. "If we could select the best seeds of the finest butterflies we should be able to get extra large and handsome butterflies."

"But those eggs that our big red and brown moth laid on the curtain last spring did not hatch at all," said Molly.

"That," answered father, "was because they had not been fertilized. Only fertile eggs are able to hatch."

"Do you mean they needed pollen?" asked Johnny opening his eyes.

"I mean just that," said father. "Butterfly eggs cannot hatch without pollen any more than flower seeds can sprout without pollen."

"Do they get it from the flowers?" asked Molly.

"Think a minute," said father.

"No," put in Johnny, "that wouldn't do. The butterfly that lays the eggs is the mother. So the father must be a butterfly too."

"Perfectly right," said father. "It is just the same with the insects as with the flowers. The eggs must be fertilized by a male of the same kind. You remember the lily could not fertilize the rose. Well, the bee's eggs must be fertilized by a bee, and the fly's eggs by a fly. More than this the eggs of the honey-bee must be fertilized by a honey-bee, those of a bumblebee by a bumblebee, your big cecropia moth's eggs must be fertilized by a cecropia moth."

"It would not do to mix them up any more than it would do to mix up the flowers," added Johnny.

"No indeed," said mother who had just joined the trio. "Just think how beautiful it is that everything is so well arranged, so that our butterflies inherit their beautiful wings from the parent butterflies and our honey-bees always inherit the instinct to make honey."

"But could we change insects the way we do plants by cross fertilizing?" Johnny wanted to know.

"Yes," father replied, "it would be possible but very difficult because insects move about so."

"It has been done to a small extent with butterflies as an experiment," mother went on, "but there is not enough reason for doing it to make people take the trouble."

"Insects are not useful like flowers," said Molly.

"They are not useful to us in the same way," replied father. "And it doesn't matter so much about their colours because they fly about, while the flowers stay where we put them."

"Father," asked Johnny later, "where is the pollen in the butterfly?"

"It is inside the body of the male butterfly, just as the eggs are inside the body of the female butterfly," replied father.

"Just think how wonderful," mother added; "there is the little house of life that we call the ovary in each female butterfly. In this house of life grow the tiny seeds or eggs. How marvellous these tiny seeds are! Each one of them can grow into a beautiful butterfly with a long tongue, six legs, two big eyes and a pair of wings covered with tiny bright coloured scales. How do you suppose that little bit of an egg can do such wonderful things?"

"It is the power of life," said father; "it is God working through the little seed."

"But it cannot grow unless fertilized," said Johnny. "Nor do well unless it has a good environment."

"That is true," said father, "for that is the law. We must find out the laws of na-

ture which are the laws of God, and obey them."

"I don't see how its environment can affect a butterfly," said Johnny thoughtfully. "It can fly where it pleases."

"But it can't when it's an egg," promptly added Molly. "It has to be laid on the right leaf, and it has to have plenty of leaves to eat when it hatches."

"Yes," added father, "and it must be in the right place while it is a chrysalis, not too wet or too dry, for when the butterfly comes out if the air is too dry the bright wings wither up instead of expanding."

"How does the pollen of the butterfly get to the egg?" Johnny asked one day.

"There is a little tube connected with the tiny house of life where the pollen lies," replied father, "and when the eggs are ripe in the house of life in the female butterfly, then the male butterfly sends the pollen to them by means of this tube, so that the eggs are fertilized before they are laid."

"Why not after they are laid?" asked Johnny.

"Because," said mother, who was also listening, "the surest way for these little life seeds to find their way to the eggs is in the safe house of life in the body of the mother butterfly. They might get chilled and die if

they tried to find the eggs after they had been laid on the leaf."

"Is it the same with all insects?" asked Johnny.

"Yes," said father, "it is the same with all. The flies also mate, as we say when the life seeds are sent from the male house of life to the female house of life. It is the same with the beetles and the dragon-flies, the bees and the wasps, and all insects."

"How does the butterfly know when the eggs are ripe?" asked Molly.

"That," said father, "is a part of the great law of life, a part of God's law, that when the eggs are ripe in their house of life, the other little life seeds shall also be ripe in their house of life, and the parents know that this is so, and that they must place the two together. When this happens and the eggs are fertilized each egg begins to grow into a new butterfly. This growth begins in the mother's house of life, as you well know, and continues after the egg is laid."

"Is the flower ovary a house of life too?" asked Johnny.

"Yes," said father, "the flower ovary is a house of life, and the anther that holds the pollen is a house of life. Wherever new life takes its start, that is the house of life."

VI

HOW FISH LAY THEIR EGGS IN WATER

"DO fishes have a house of life?" asked Johnny one day as he stood watching a goldfish in his mother's aquarium.

"Yes," said father, "fishes also have a house of life. You remember the shad roe you liked so much last spring. That was the ovary filled with fish eggs."

"But not all the shad had these ovaries, had they?" asked Molly. "Only some of them. Because the others had something that looked a little like them, but different, and we did not eat it. Was that the house of life of the male fish?"

"Yes," assented father, "it was. If you could have examined what was inside that male house of life with a microscope you would have found it filled with a liquid in which was suspended millions and millions of little life seeds."

"The pollen of the fishes," said Molly.

"Yes," agreed father, "the pollen of the fishes. Mother, you tell them how the fish eggs are fertilized."

"You see," mother replied, "fishes live in

the water. Their life is different from that of land animals, because their environment is so different."

"They breathe water for one thing," said Molly.

"No indeed!" exclaimed Johnny. "They breathe air. Father says all living things, plants and animals, breathe air."

"But where do they get it?" asked Molly.

"There is always a little air mixed in with the water—enough for fishes to breathe," answered Johnny who remembered what his father had once told him.

"That is true," said mother, "and if there was no air at all in the water the fishes would smother. Well, the female fish lays her eggs in some quiet, safe place where she thinks the young fishes will have a good chance to hatch out."

"She gives them a good environment," said Molly.

"Yes," mother went on; "and after the eggs are laid, the male fish, who has kept close to her, swims over them, and pours out the seeds from his house of life upon them. The fish eggs, unlike those of the insect, are fertilized after they are laid."

"Why is that?" asked Johnny.

"Because it is the easiest and best way," replied mother. "The fertilizing fluid of the

fish is not too much chilled by the water and it cannot dry up in the water, but flows over the eggs, so that the little seeds of life can find their way into the egg and fertilize it."

"Sometimes," joined in father, "fishes make nests. The stickleback is such a fish. It makes its nest in the grasses in the water and the father fish stays about and protects the eggs from being eaten up by other fish."

"And the black bass, father," added mother, "takes care of his offspring after they hatch out. He goes with them to find food, and fights for them against their enemies."

"Do all fishes care for their offspring?" Johnny inquired one day.

"No, they don't," answered mother. "Most fishes do no more than lay the eggs in a good environment. There they leave them to their fate."

"Isn't that cruel?" asked Molly.

"It would be if the fishes knew any better," replied father. "But they have not minds and hearts like us. They are not able to love and to know. They follow their instincts only."

"What are instincts, father?" asked Molly.

"Instinct is the knowledge animals are born with, without thinking. It is instinct that makes the young animal eat as soon as it is born, instinct that teaches the birds to build their nests, the young fishes to swim and the

baby quail to lie perfectly still when an enemy approaches."

"Why doesn't instinct make all the fishes love and care for their offspring?" mother asked.

"Because," answered father, "the fish is a very simple form of life and lays so many eggs that special care is not needed in order to preserve as many fishes as there is food for in the water. You know fishes must eat. If all fish eggs hatched out and grew up there would not be room in the sea to hold them, for some fishes lay as many as a million eggs in one season."

"What becomes of them?" asked Johnny.

"A good many are eaten by crabs and fishes and other animals, a good many hatch out only to be eaten up while young."

"That seems horrible," said Molly.

"But when you come to think of it, it is not horrible," said father. "You do not mind eating the seeds of the flowers, the corn and wheat, the peas and beans. Well, the fishes are not unlike the flowers. They scatter their seeds in the greatest abundance, only taking care to lay them in as good an environment as they can find. After the seeds are laid and fertilized, most fishes, like the flowers, pay no more attention to them."

"But it is not that way with the birds," said Molly, "and I am glad it isn't."

VII

WHY BIRDS GROW INSIDE OF SHELLS

"HOW the birds seem to love their little baby birds," said Molly one day. "Let's go and see, father, what the wrens are doing now,"—and they all went to the back of the house where a pair of wrens had built their nest in a corner of the woodshed. There sat the little mother wren on the eggs. She turned a bright eye upon them as they came close, but she was not afraid because she knew that they would not hurt her. Near her the male bird was alternately singing and scolding as he darted about through the tangle of raspberry bushes.

"What a pretty place for a nest," said mother—"so safe, close to us, and near the window so that the little mother bird can look out into the garden while she is brooding the eggs."

"Sometimes the father bird sits on them," added Johnny who had watched the little family with the greatest care.

"Yes, they take turns," father went on, "so neither will get too tired. It is wearisome work for such active little creatures to sit still so long at a time."

"It is because they know what is to come out of those eggs, and dearly love their baby birds," said mother.

"They were careful to find them a good safe environment," added Johnny. "Do you remember, Molly, the mocking-birds in Florida that spring who built their nest way back among the sharp thorns of the old orange tree? That was a safe place!"

"I should think so," exclaimed Molly; "and how the birds come up North every spring to build their nests. Is that so the young ones will have a better environment to grow in?"

"I think so," replied father; "and they all go South in the autumn to find a good environment in which to pass the winter."

"See!" cried Molly. "There comes Mr. Wren bringing a fat worm to his lady on the nest. Now what is he scolding about? Oh, he sees the cat. Puss won't touch you. She has been taught better."

"Do you remember how the robins chased that old cat up at the farm?" and Johnny chuckled at the memory.

"Yes," said Molly, "they drove him under the house and screamed and scolded whenever they saw him."

"I wonder how they dared go so near him," said Johnny still laughing.

"That," Molly informed him, "was because they had a nest in the apple tree. Parents forget themselves when their children are in danger."

"Yes," said mother, "many little parents among the feathered and furry folk have died to save their young ones."

"I suppose," said Johnny, "that every bird has a house of life."

"Yes," answered mother; "the bird, like the fishes and the flowers, has its wonderful house of life where the seeds of its race develop."

"But the bird's eggs are not little, like the eggs of the fishes and insects," said Molly.

"At first they are as small as a fish egg," replied father. "They grow in a little ovary that lies inside the bird near the backbone and are called ovules. When the time comes the ovules ripen, one after the other. About the little seed of life there gathers yellow oil and food substance until we have the full-grown yolk. This finds its way into the oviduct, a soft tube or pipe along which it moves to the outer opening through which it passes to drop into the nest. But on the way through this tube there gathers about the yolk the part we call the white of the egg. This, too, is food substance. The young bird, as you know, grows inside the egg-shell and it needs very

good food to grow on. All this food is changed into the young bird before it hatches, and soon before the egg is laid the shell forms about it. The shell is liquid at first, but it quickly hardens as it forms about the egg."

"Sometimes the hen's egg is laid without any shell. I have found such eggs, soft eggs the farmer calls them, in the hen-house," said Johnny.

"Yes," added mother, "that sometimes happens, but the natural way, if the hen has the right kind of food, is for the shell to form so that the egg will be protected when it is laid. Neither the hen nor any other bird could sit on shelless eggs, you know, without breaking them.

"Now about fertilization," mother went on. "When do you think that takes place,—before the egg is laid, or after?"

"Why, before," said Johnny after thinking a moment.

"Yes," added Molly, "it would have to be before the shell formed, I should think."

"That is true," said mother. "The seeds of life grow in the male bird just as the eggs grow in the female bird, and before the shell is formed these tiny seeds are placed in the oviduct where they find their way to the little opening in the eggs that is there for them to enter. These little pollen seeds of the bird can

move. Under the microscope they look a little like long-tailed tadpoles. They lash the tail-like part and swim about in the fluid in which they live until one of them finds the opening into the egg. When it enters, the opening closes. Then the shell forms, enclosing the two life seeds and the egg is laid in the nest."

"The father bird helps take care of the eggs because they belong to him too," said Molly.

"Yes," added Johnny, "the little birds inherit from him too ; they are just as much his as they are the mother bird's."

"But the egg is much larger than the pollen seed," said Molly.

"That," said father smiling, "doesn't really matter. What matters is that the spark of life is in each, and that when the two become one, the young bird can begin to form. It depends upon one parent quite as much as on the other, and the pollen seed is able to transmit all the characteristics of the father just as the tiny ovule transmits those of the mother."

"It makes fathers love their offspring," said Molly.

"It certainly does," answered father.

"Suppose," said Johnny, "a hen's egg was not fertilized. What would become of it?"

"It would get its shell and be laid just the same," answered father, "but it could not

hatch. People who raise hens for eggs sometimes keep no male bird. The hens lay just as well, but the eggs are all sterile, which means that they have not been fertilized and cannot hatch."

"I think it is wonderful," said Molly.

"It is," said mother. "Just think what beautiful creatures develop from these tiny seeds of life. Just think how all the birds in the world have been stored up in these wonderful seeds."

"And all the fishes and insects and about everything else," added Johnny.

"And how these little seeds of life remember, each one, the characteristics of the parent whence it came, even to the making of the wonderful feathers of the bird of paradise, the barred feathers of the owl, the bright red and yellow feathers of the parrot," added father.

"And the shining scales of the fishes that are such pretty colours and show such pretty markings under the microscope," added Johnny.

"The perfection of it all is amazing," said father. "Here are some pollen grains under the microscope—just look and see how those tiny things are shaped and marked as prettily and as carefully as sea-shells."

"What kind of pollen is it?" asked Molly peeping into the microscope.

"There are several kinds," answered father. "I brushed my hand across the flowers as I passed through the garden, and found it dusted with many colours of pollen, so I thought I would see what they really look like."

"Such pretty, pretty things," exclaimed Molly. "Does each flower have its pollen grains all the same shape?"

"Yes," said father; "we could tell by the appearance of the pollen grain what flower it came from, if we knew enough."

"And we can tell by the seeds what flowers they came from," added Molly.

"These seeds of life that cradle the races of the future are the most wonderful things in existence, next to the human soul," said father reverently.

"There is nothing much more wonderful than the bird's egg and its development, and the loving care taken of it by the birds," said mother as the male wren hopped to the nest where his mate was sitting, as though to show them how well he loved the little brown mother bird and their charming eggs.

"It is cruel to take birds' eggs," said Molly. "Cruel and hateful. But we can take the hen's eggs to eat."

"Why isn't that just as cruel?" asked Johnny. "The hen lays eggs in order to hatch them, doesn't she?"

"Well," answered father, "in the hen you have an example of breeding for a special purpose. For thousands of years man has bred hens to lay eggs until the hen has become a sort of egg-laying machine. Many hens do not care to sit, as you know. Some varieties are great layers but such poor sitters that their eggs have to be hatched by some other kind of hen, or in an incubator. In those hens the brooding instinct has been destroyed."

"People bred their chickens that way on purpose to get eggs," said Molly.

"That is true," added father; "we take care of the hens and feed them the best of food, and they repay us by laying eggs for our use."

"It isn't cruel to take the eggs out of the nests then," said Molly.

"No, indeed," replied father, "it isn't cruel at all. When a hen wants to sit, we generally let her, but think what thousands of eggs would be wasted if we did not take them."

"Could birds be bred to lay eggs?" asked Johnny, still watching the wrens.

"I am sure they could," said father, "but it wouldn't pay. If a bird's eggs are destroyed the bird often lays another set; sometimes it may even lay two or three sets."

VIII

HOW PRIZE CHICKENS AND FANCY PIGEONS ARE BROUGHT ABOUT

"GREAT oaks from little acorns grow," said Johnny lying on his back under the big oak one day and looking up into its branches.

"And a splendid apple tree from a little black seed," added Molly.

"But it seems more wonderful to me that a peacock with its gorgeous feathers can develop from an egg that is just a spoonful of soft stuff with a hard shell around it," said Johnny thoughtfully.

"The most beautiful thing about it to me," said mother, "is that we can by selecting the best seeds and providing a good environment get better and better offspring in both the plant and animal world."

"Did our white Wyandotte chickens come from selection?" inquired Molly.

"Yes," said father, "it took long and careful breeding to get those beautiful and useful birds. And now we must continue mating the finest birds and selecting the best eggs laid by them to keep up the breed."

"Yes," said mother, "you know how much

pains father takes to find out which hens lay the most eggs, and to take those eggs for hatching."

"Yes, and how much pains we all take to give those chickens a good environment," added Johnny with a sigh. "It is nothing but clean the hen-house and chicken yard, keep the water fresh, watch for cats and skunks and foxes and rats, see that the rain does not get in, nor draughts blow on the chickens at night. They are really a great deal of trouble."

"But how well they repay us," added father laughing. "We keep fewer hens but get many more eggs and much better poultry than our neighbours whose chickens are not so well cared for and not so well bred."

"Have all the different kinds of prize chickens been made by breeding?" asked Molly.

"Yes, all of them," said father.

"And the pigeons too," added Johnny. "All those funny fantail and pouter pigeons and tumblers."

"Yes, they were made by careful breeding," said father. "It is very interesting. You decide what kind of bird you want to get, then you choose for parents the two birds that are most like what you want. You select parents from the offspring of these and keep on selecting generation after generation until you get

just what you want. Sometimes it takes a good while to get just what you planned for, but if you are persevering and skillful you will succeed in time."

"But you would have to keep mating birds that were closely related," said mother, "and I thought that cross-fertilizing was needful in animals as well as in plants."

"It is," said father, "and that is one reason why the very fancy pigeons are so delicate; they have been too much in-bred as we say."

"Is that why you sent away for a new rooster last spring?" asked Johnny.

"Yes," said father. "I wanted my little chickens to be strong and healthy, and so I exchanged one of our beautiful cocks with a friend who also breeds carefully for egg-laying."

"Why does it matter so much about the cock? He doesn't lay eggs anyway," said Molly.

"Why, Molly," said Johnny indignantly, "have you forgotten about inheritance?"

"Yes," said mother soothingly, "although the cock may not lay eggs if he comes from a good egg-laying line, his offspring will inherit through him the egg-laying power."

"It is important for both parents to come from good egg-laying stock, for the male bird quite as much as for the hen," said Johnny.

"Indeed, it is very important," agreed

father. "In fact, the pedigree of the male is just as important as that of the female in all forms of life."

"It seems to me," said Molly, "that about everything lays eggs. Turtles do, for we found some turtle eggs last year, and snakes do, but turtles and snakes do not hatch their eggs themselves, they just bury them in the sand and leave them to hatch out the best way they can."

"That," said mother, "is because they are able to hatch from the heat of the sun. Cold-blooded animals do not need to be kept very warm even in the egg. You may be very sure that if the eggs could not hatch without the mother's care, she would look after them."

"Frogs' eggs hatch out into tadpoles in the water, so I suppose frogs are cold-blooded animals," said Johnny.

"They are," replied father.

"All the warm-blooded animals, that is, all birds and mammals, take care of their young."

"Do all birds?" asked Johnny. "I thought ostriches didn't."

"It is the rule," said father, "but most rules have exceptions, you know."

IX

HOW KITTENS START FROM EGGS

"WHAT are mammals?" asked Johnny one day.

"Mammals are warm-blooded animals that suckle their young," replied mother.

"Birds are warm-blooded, but they are not mammals," said Molly.

"Come with me, and I will show you something," said father with a twinkle in his eye. So they all followed him out to the barn. And there, in a warm bed of hay under the feed box in the manger, they heard a loud purring.

"It is Pussy Willow!" whispered Molly excitedly as she peeped in. "And oh! oh! oh! there is a whole snuggle of little baby pussies!"

"Do let me look!" said Johnny pulling her arm.

"There are five," said Johnny; "three of them yellow and white like Pussy Willow, and two black and white ones. Can I take one out?"

"Yes, but be very gentle," said father.

"Of course," replied Johnny, and in a moment all the heads were bent over the fuzzy

little object lying in Johnny's hand. "It is marked exactly like Pussy Willow," he said.

"Let me hold it," begged Molly.

"I will get you another one," and Johnny dived down into the manger again and in a moment put a soft little bundle of fur into Molly's outstretched hand.

"How perfectly lovely!" exclaimed the little girl. "See how sweet it is—yellow and white with black on its back and legs. Where did the black colour come from? There isn't a bit on Pussy Willow."

"See," and Johnny drew another kitten from the manger; "here is one nearly all black; it has only white toes and a white shirt front. The kittens must have had a black father."

"Let me see," and Molly looked with interest at the black little fellow.

"Johnny," she cried at length, "do you know who that kitten looks like?"

Johnny laughed. "Of course I do; it is marked just like black Tom who lives next door. I guess he's the father of our kittens."

"You had better give them back to their mother now," said mother. "They are too young to be handled much."

"Pussy Willow doesn't care; hear her purr," laughed Molly.

"No, she trusts us," answered father, "but

you know the very best environment for young kittens is close to their warm little mother, where they can eat and sleep until they get their eyes open."

"Why aren't kittens born with their eyes open?" asked Molly.

"It seems to be the law," said mother, "that young things shall come into the world only partly developed."

"It is so with butterflies," said Molly; "they start as caterpillars."

"And frogs and lizards start as pollywogs," added Johnny.

"And kitties are born blind, and so are puppies. But little calves and colts are not."

"No," said mother; "the calves and colts are not born blind, but they are dependent upon their mothers for milk to keep them alive, and for protection from enemies. You remember how Crumplehorn gored and trampled the ugly dog that was trying to worry her calf."

"Yes, and the white mare was quite dangerous for several days after her colt came," added Johnny. "Even the farmer did not dare go near her. She chased everybody out of the field."

"It is the helplessness of the little new-born things that makes their mothers love them so," said father. "Love is the greatest thing

in the world, and these helpless little creatures have done much to bring love into the world."

The kittens grew fast, and one day Pussy Willow brought them, one at a time, in her mouth, into the house. The children were delighted to see her coming holding a fluffy kitten by the back of the neck. They made a warm bed for her behind the kitchen stove.

"Now," said Molly, "we must feed pussy well; so much depends on good food to start with, you know."

"But the kittens drink their mother's milk," said Johnny.

"Think a minute, Johnny," said father who happened to come in at the moment. "Where does Pussy Willow get her milk?"

"To be sure," replied Johnny, "she has to eat enough to make milk for all those kittens as well as to keep herself fed. That is why the Smiths' cat that comes prowling about our garbage pail is so awfully thin. They don't feed her and she has three or four scrawny kittens, not at all pretty and plump like our kits."

"Poor little mother cat," said Molly. "I am going to put a dish of milk out by the garbage pail every day for her; may I, mother?"

"Of course," said mother. "It is cruel to starve any mother that is suckling her young. Not only do the young ones suffer, but there

is no hunger so keen as that which the hungry mother feels."

"Pussy Willow doesn't suffer," said Molly. "She's as sleek as can be and the kittens are as round and fat as butterballs."

"They have a pretty good environment behind the kitchen stove," said mother laughing.

"There is something about Pussy Willow I don't understand," said Johnny as they were sitting by a blazing fire one cool evening. "Of course, I know that she too must have a house of life where the young develop. But how do they start?"

"How does the chicken start?" asked father; "and the birds, and the fishes, the frogs, the lizards, the snakes, the insects and the turtles?"

"Why, they start as eggs, of course, but that is just it; Pussy Willow doesn't lay eggs."

"No, not exactly, and yet each of those kittens began as a tiny ovule no bigger than a pin-head in the ovary of the mother."

"Tell us about it," begged Molly, and father went on.

"You see the ovary of the cat, like that of the bird, connects with the outer world by means of a long, soft tube. When the little ovule is ripe it passes into this tube. Now if the life seeds of the male have been placed in

the tube they find their way to the little ovule, and one of them enters it. You know what happens then."

"It begins to develop," said Johnny.

"True," said father; "and generally several ovules start about the same time but instead of passing at once out of the tube, these ovules remain within it and there continue to develop."

"I see," said Johnny. "The egg of the bird is first laid and then hatched, while the ovule of the cat hatches before it is——"

"Born," interrupted mother. "We speak of the egg being laid, and the kitten being born, but it is really the same thing. Whenever the young life comes from its mother into the world it is born."

"And so our kitties started as little eggs," said Molly. "How nice it is that all animals start alike. It makes it so easy to remember."

"Black Tom," said Johnny, "can never have any kittens the way Pussy Willow has them, but still they are just as much his as hers."

"But he doesn't care anything about them," said Molly. "Why doesn't he?"

"Because," said mother, "he is a cat, and the male cat does not care for his offspring, although male cats have been known to watch over and protect little kittens. As a rule,

though, they do not care for them. That is all left to the mother. Such is the law of nature."

"Could cats be bred so that the male cat would love the kittens?" asked Johnny thoughtfully.

"Undoubtedly it could be done," answered father; "but there is no good reason for doing it now."

"But," said mother, "one can imagine what a beautiful place the world might be if all living creatures were bred up to their best."

"Do you know, mother," said Johnny, taking his mother's hand one day and laying his cheek against it, "I understand now how human beings come into the world. The law is the same everywhere, isn't it?"

"Yes," said mother. "God has one general law that works through all life, and father and I have told you carefully about the development of the different forms of life on purpose to help you understand the great and wonderful mystery in the human life."

"Well, then, heredity," said Johnny, "counts for a great deal, doesn't it, father?"

"For everything. Its importance cannot be overestimated," replied father. "What the parents are, that the children, within limits, will be. Every child born into the world ought to have a good inheritance and ——"

"A good environment," finished Molly.

"Yes. A good inheritance and a good environment," repeated father. "It is the duty of every man and woman to cultivate a healthy body and a pure mind, for the sake of those who may be born from them."

"Even children," said mother, "ought to be trained so that they will make good parents. They ought to love and respect their bodies, keep them clean, and never do anything to defile them. They never ought to think evil or unclean thoughts, for such thoughts harm the body as well as the mind."

"Well, I am going to try," said Johnny.

"So am I," said Molly. "I want to marry when I grow up and have some beautiful children."

"So do I," said Johnny, "and I am glad they will really belong to me too. I am going to try and be as good a father to my children as you, father, have been to us."

"And I," said Molly, "am going to try and be as good a mother to my little children as you, mother, have been to us."

"May God bless you," said father laying a hand on the head of each.

"Amen," said mother softly.

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2

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Edward Bok says: "No parent can truthfully say again: 'No one has ever told the story of life simple enough for a child to understand.' For here it is,—told as simply and beautifully as I have ever seen it told anywhere."

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5. The Changing Girl. A Little Book for the Girl of Ten to Fifteen, by Caroline Latimer, M. D., M. A.

Edward Bok says: "Dr. Latimer makes her book a complete little guide within the compass of her space. If a girl, at the changing period in her life, intelligently reads and remembers what is said she will have an understanding of her physical and moral self that will give her exactly the knowledge that every girl should have."